



3412 N. 36th St.
Boise, ID 83703

Date	Estimate #
9/28/2017	2016.603

Name / Address
Konrad Fisher

Project

Item	Description	Qty	Rate	Total
MATERIALS	<p>1325 Watt Hydro Turbine Includes: (1) PowerSpout Pelton Hydro (1) MidNite 3 breaker combiner box (1) 15A fuse and holder (1) 60A 150DC Breaker (1) 60A 300VDC Breaker (1) OutBack FM80 Charge Controller (1) Powerspout PowerClamp for hydro voltage protection (1) Relay for hydro heat dump (1) Water heating or air element (customer preference) Wiring and Conduit to Power System (ESTIMATED @30ft as distance is unkown)</p> <p>Site Assumptions: Head:400 ft Flow: 112 GPM Size of Pipe: 6" Length of Pipe: 4000ft Hydro Output: 1398 Watts</p> <p>NOTE: The charge controller can accomodate up to 3800 Watts of hydro so a turbine and 1 Breaker would be needed to add a second hydro \$1625 Additional.</p> <p>A third hydro would require another charge controller, so the additional cost of a third hydro, charge controller and related breakers would be \$2438 additional</p> <p>The total output of 3 hydro turbines would be 4180 Watts using 104 GPM. (.23 CFS)</p>			3,744.86T

Subtotal
Sales Tax (6.0%)
Total



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Auto Grease Kit	Price does not include the installation of the pipeline, plumbing or related materials as the specific site conditions are unknown. Automatic grease lubricator, bracket, tube and fittings (NEED 1 Per Hydro)	1	100.00	100.00T
SCREENS	Hydro Screen \$500-1500 depending on the output size and how the diversion is setup	1	0.00	0.00T
Engineering	Consultation, and design of electrical and hydro system. Wiring diagram included	8	125.00	1,000.00
INSTALLATIO...	Design and Installation of the Hydro Power System. Interconnection with the House Power System			2,056.00

All estimates are valid for 30 days from the date of issuance. All parts must be prepaid prior to order. Customer is responsible for any permitting, CC&Rs, or any other local property limitations pertinent to the installation. All system installations are subject to the provided contract. There will be an additional battery core charge of \$35 per battery if no battery is turned in with purchase. For new battery installations, core charge may be waived with a signed affidavit.

Subtotal	\$6,900.86
Sales Tax (6.0%)	\$230.69
Total	\$7,131.55



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MATERIALS	900 Watt Solar System Includes: (3) Solarworld 300 Watt Solar Panel (1) Top of pole mount for 3 solar panels (1) MidNite Combiner Box (1) 20 A DC Breaker (1) Grounding Kit with solid copper and lug			2,296.17T
MATERIALS	3.6 kW Outback Power System Includes: (1) Outback VFX 3.6 kW Inverter 120VAC 30A output Electrical Panel With AC and DC Breakers 120VAC Bypass Generator input breaker Ground Fault Detection Outback FM 60 Charge Controller (for solar) Mate 3 Programming Module (May also be used for web monitoring) Remote Temperature Sensor Lightning Arrestors for AC and DC 15' 2/0 Battery Cables Conduit for battery bank			5,563.54T
MATERIALS	Lead Acid 400 Ah Battery Bank Includes: (8) Centennial 400Ah 6V Batteries Sealed Batteries (5 year warranty 2 year full, 3 year prorated) (7) 2/0 Battery Links Recommended Upgrade: Double the battery bank to 800AH for \$3424 additional			3,424.40T

Subtotal

Sales Tax (6.0%)

Total



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INSTALLATIO...	<p>Design and Installation of the Solar Power System Includes: Installation of single solar panel Installation of the inverter, and battery bank Connection of generator and connection to power system Programming of inverter, charge controller and generator for automatic operation. Customer training on system operation Travel Time and Mileage to the site</p> <p>NOTE: We will need to work with your local electrician or we can bring one in to connect the output of this system to the home's service panel This system can also be web monitored and controlled remotely for \$150 additional.</p>			4,740.00

Subtotal				\$16,024.11
Sales Tax (6.0%)				\$677.05
Total				\$16,701.16

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Sunmodule[®] Plus

SW 285-300 MONO (5-busbar)

Exhibit KR-5



TUV Power controlled:
Lowest measuring tolerance in industry



Every component is tested to meet
3 times IEC requirements



Designed to withstand heavy
accumulations of snow and ice



Sunmodule Plus:
Positive performance tolerance



25-year linear performance warranty
and 10-year product warranty



Glass with anti-reflective coating



World-class quality

Fully-automated production lines and seamless monitoring of the process and material ensure the quality that the company sets as its benchmark for its sites worldwide.

SolarWorld Plus-Sorting

Plus-Sorting guarantees highest system efficiency. SolarWorld only delivers modules that have greater than or equal to the nameplate rated power.

25-year linear performance guarantee and extension of product warranty to 10 years

SolarWorld guarantees a maximum performance digression of 0.7% p.a. in the course of 25 years, a significant added value compared to the two-phase warranties common in the industry, along with our industry-first 10-year product warranty.**

* Solar cells manufactured in U.S.A. or Germany. Modules assembled in U.S.A.
**in accordance with the applicable SolarWorld Limited Warranty at purchase.
www.solarworld.com/warranty



- Qualified, IEC 61215
- Safety tested, IEC 61730
- Blowing sand resistance, IEC 60068-2-68
- Ammonia resistance, IEC 62716
- Salt mist corrosion, IEC 61701
- Periodic inspection



- Periodic inspection
- Power controlled



Sunmodule[®] Plus

SW 285-300 MONO (5-busbar)



PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)*

		SW 285	SW 290	SW 295	SW 300
Maximum power	P_{max}	285 Wp	290 Wp	295 Wp	300 Wp
Open circuit voltage	V_{oc}	39.7 V	39.9 V	40.0 V	40.1 V
Maximum power point voltage	V_{mpp}	31.3 V	31.4 V	31.5 V	31.6 V
Short circuit current	I_{sc}	9.84 A	9.97 A	10.10 A	10.23 A
Maximum power point current	I_{mpp}	9.20 A	9.33 A	9.45 A	9.57 A
Module efficiency	η_m	17.00 %	17.30 %	17.59 %	17.89 %

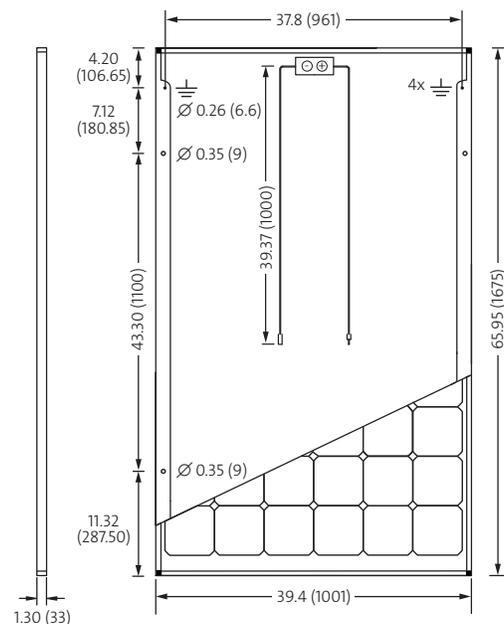
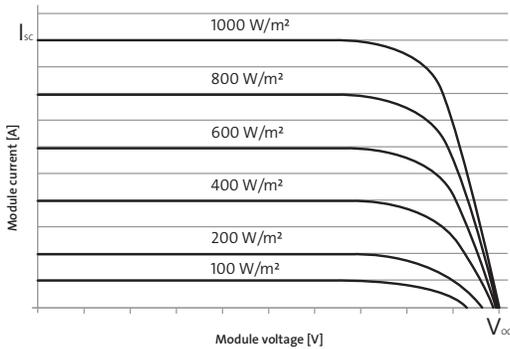
*STC: 1000W/m², 25 °C, AM 1.5

PERFORMANCE AT 800 W/M², NOCT, AM 1.5

		SW 285	SW 290	SW 295	SW 300*
Maximum power	P_{max}	213.1 Wp	217.1 Wp	220.5 Wp	224.1 Wp
Open circuit voltage	V_{oc}	36.4 V	36.6 V	36.7 V	36.9 V
Maximum power point voltage	V_{mpp}	28.7 V	28.8 V	28.9 V	31.1 V
Short circuit current	I_{sc}	7.96 A	8.06 A	8.17 A	8.27 A
Maximum power point current	I_{mpp}	7.43 A	7.54 A	7.64 A	7.75 A

Minor reduction in efficiency under partial load conditions at 25 °C: at 200 W/m², 100% of the STC efficiency (1000 W/m²) is achieved.

*Preliminary values, subject to change.



All units provided are imperial. SI units provided in parentheses.
SolarWorld AG reserves the right to make specification changes without notice.

COMPONENT MATERIALS

Cells per module	60	Front	Low-iron tempered glass with ARC (EN 12150)
Cell type	Monocrystalline 5-busbar	Frame	Clear anodized aluminum
Cell dimensions	6.17 in x 6.17 in (156.75 x 156.75 mm)	Weight	39.7 lbs (18.0 kg)

THERMAL CHARACTERISTICS

NOCT	46 °C
TCI_{sc}	0.04 % / °C
TCV_{oc}	-0.30 % / °C
TCP_{mpp}	-0.41 % / °C
Operating temp	-40 to +85 °C

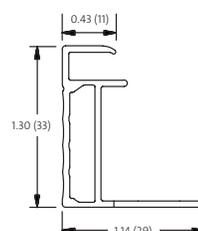
ADDITIONAL DATA

Power sorting	-0 Wp/+5 Wp
J-Box	IP65
Connector	PV wire per UL4703 with H4/UTX connectors
Module fire performance	(UL 1703) Type 1

PARAMETERS FOR OPTIMAL SYSTEM INTEGRATION

Maximum system voltage SC II / NEC	1000 V	
Maximum reverse current	25 A	
Number of bypass diodes	3	
Design loads*	Two rail system	113 psf downward, 64 psf upward
Design loads*	Three rail system	178 psf downward, 64 psf upward
Design loads*	Edge mounting	178 psf downward, 41 psf upward

* Please refer to the Sunmodule installation instructions for the details associated with these load cases.



- Compatible with both "Top-Down" and "Bottom" mounting methods
- \perp Grounding Locations:
 - 4 locations along the length of the module in the extended flange.

SW-01-7510US 160324



FX & VFX Series

Sealed & Vented True Sinewave Inverter/Charger

Exhibit KR-5

Sealed FX

- Sinewave Output
- Intelligent Battery Charging
- Modular, Stackable Design
- High Operating Efficiency
- Weather-resistant Sealed Chassis
- Field Serviceable
- Integrated Network Communications
- Standard 5-Year Warranty

Vented VFX

- Sinewave Output
- Intelligent Battery Charging
- Modular, Stackable Design
- High Operating Efficiency
- Bug Proof Chassis
- Corrosion Resistant Internal Components
- Field Serviceable
- Integrated Network Communications
- Standard 5-Year Warranty



Vented VFX

Sealed FX



OutBack Power's true sinewave inverter/charger is a complete power solution. It incorporates a DC-to-AC sinewave inverter, battery charger and AC transfer relay housed within a die-cast aluminum chassis. Intelligent multistage battery charging reduces generator run-time and prolongs the life of your batteries. Built-in networked communications enables multiple units to be stacked and connected with other OutBack Power electronics providing industry leading integration and near infinite application flexibility. The exclusive modular system architecture means that increased power output is just an additional inverter/charger away.

Our flagship FX series uses a sealed chassis that can operate in the harshest environmental conditions such as high humidity and corrosive salt air. The VFX series uses a vented chassis with bug proof screened openings that allow high output AC power in the hottest of operating conditions.

OutBack Power Inverter/Chargers are the only choice when you need a true sinewave, powerful, modular and reliable power solution for your home, business or extreme application.

OutBack
POWER™
member of The  Group™

www.outbackpower.com

		Sealed Models			Vented Models		
		FX2012T	FX2524T	FX3048T	VFX2812	VFX3524	VFX3648
Nominal DC Input Voltage		12 VDC	24 VDC	48 VDC	12 VDC	24 VDC	48 VDC
Continuous Power Rating at 25°C (77°F)		2000 VA	2500 VA	3000 VA	2800 VA	3500 VA	3600 VA
AC Voltage/Frequency		120 VAC / 60 Hz	1200 VAC / 60 Hz	1200 VAC / 60 Hz	120 VAC / 60 Hz	1200 VAC / 60 Hz	120 VAC / 60 Hz
Continuous AC RMS Output at 25°C (77°F)		17 Amps AC	20.8 Amps AC	25 Amps AC	23.3 Amps AC	29.2 Amps AC	30 Amps AC
Idle Power	Full	~ 20 Watts	~ 23 Watts	~ 23 Watts	~ 20 Watts	~ 20 Watts	~23 Watts
	Search	~ 6 Watts	~ 6 Watts	~ 6 Watts	~ 6 Watts	~ 6 Watts	~ 6 Watts
Typical Efficiency		90%	93%	93%	90%	92%	93%
Total Harmonic Distortion	Typical	2%	2%	2%	2%	2%	2%
	Maximum	5%	5%	5%	5%	5%	5%
Output Voltage Regulation		±2%	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	Peak	56 Amps AC	70 Amps AC	70 Amps AC	56 Amps AC	70 Amps AC	70 Amps AC
	RMS	40 Amps AC	50 Amps AC	50 Amps AC	40 Amps AC	50 Amps AC	50 Amps AC
AC Overload Capability	Surge	4800 VA	6000 VA	6000 VA	4800 VA	6000 VA	6000 VA
	5 Seconds	4000 VA	4800 VA	4800 VA	4000 VA	5000 VA	5000 VA
	30 Minutes	2500 VA	3200 VA	3200 VA	3200 VA	4000 VA	4000 VA
AC Input Current Maximum		60 Amps AC	60 Amps AC	60 Amps AC	60 Amps AC	60 Amps AC	60 Amps AC
AC Input Voltage Range (MATE Adjustable)		80 to 150 VAC	80 to 150 VAC	80 to 150 VAC	80 to 150 VAC	80 to 150 VAC	80 to 150 VAC
AC Input Frequency Range		55 to 65 Hz	55 to 65 Hz	55 to 65 Hz	55 to 65 Hz	55 to 65 Hz	55 to 65 Hz
DC Input Voltage Range		10.5 to 17 VDC	21 to 34 VDC	42 to 68 VDC	10.5 to 17 VDC	21 to 34 VDC	42 to 68 VDC
Temperature Range	Rated	0 to 50°C (power derated above 25°C)			0 to 50°C (power derated above 25°C)		
	Maximum	-25 to 60°C (Functions but does not necessarily meet all component specifications)			-25 to 60°C (Functions but does not necessarily meet all component specifications)		
Continuous Battery Charger Output		80 Amps DC	55 Amps DC	35 Amps DC	125 Amps DC	82 Amps DC	45 Amps DC
Certifications		ETL Listed to UL1741			ETL Listed to UL1741		
Warranty		Standard 5 year Warranty			Standard 5 year Warranty		
Weight	Unit	62 lbs (29 kg)			61 lbs (28 kg)		
	Shipping	67 lbs (30 kg)			67 lbs (30 kg)		
Dimensions (H x W x L)	Unit	13 x 8.25 x 16.25" (33 x 21 x 41 cm)			12 x 8.25 x 16.25" (30 x 21 x 41 cm)		
	Shipping	21.75 x 13 x 22" (55 x 33 x 56 cm)			21.75 x 13 x 22" (55 x 33 x 56 cm)		

Available From:



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 Wellington, FL 33414 USA
 Phone: +1 561 792 9651
 Fax: +1 561 792 7157



MATE3

Advanced System Display and Controller



- Program, Manage and Monitor Entire System
- Intuitive Menu Structure
- Easy-to-Read Graphical Display
- System Configuration Wizard
- Internet Enabled
- Field Upgradable
- Up to 1-Year of Data Logging
- SD Memory Card Slot



OpticsRE Compatible

The MATE3 system display and controller makes it easier than ever to program and monitor a complete OutBack Power system.

An intuitive user interface and integrated system configuration wizard make system setup and programming quick and seamless. The ability to set unique multi-level user passwords makes it possible to secure critical system settings from unintended changes while still allowing open access to necessary functions.

Other features making system management simpler include an easy-to-read graphical backlit LCD display, improved tactile buttons and user programmable "favorite" keys for immediate access to the most wanted features. An intuitive scroll wheel interface allows easy adjustment of system set points. Expandable SD memory increases data logging capacity as well as making it easy to upgrade units in the field.

A built-in clock and calendar function enables timer-based programming of inverter and charger operation. This setting allows the system to work with time-of-day power rates or to limit a generator's runtime to a specific time period of the day or week. All settings are stored in on-board memory to eliminate the need to reprogram in the event of a system shutdown or battery replacement. The MATE3 supports web-server access via an intranet to allow monitoring of an OutBack system.

